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ABSTRACT

Ninety college students wrote free-recall protocols immediately after reading each of three different passages in a study of how three factors affected the comprehension and recall of expository discourse. The three factors were the order in which a passage was read within a series of passages, the rhetorical predicate structure of the passage (cause-effect, contrast), and the topic of the passage. Analyses of the 270 protocols showed that order of presentation significantly affected the students' recall of propositions and their addition of implicit propositions. Predicate structure did not affect recall significantly, but passage topic did. The trends in the recall of explicit and implicit propositions suggested both a practice effect and a fatigue effect, because subjects produced substantially more propositions of both types for the second passage they read than for the first or third passages. Additional analyses of student recall protocols indicated the presence of an "argument" schema redirected from the text by the students to guide them in their reconstructions of the discourse. The passage topic with the lowest production of implicit propositions and the highest number of errors had only three of the four categories of the argument schema, suggesting that incomplete schemata can negatively affect recall. (RL)

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THE EFFECTS OF ORDER, RHETORICAL PREDICATE STRUCTURE AND PASSAGE TOPIC ON THE RECALL OF DISCOURSE

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THE EFFECTS OF ORDER, RHETORICAL PREDICATE STRUCTURE AND PASSAGE TOPIC ON THE RECALL OF DISCOURSE

The prose is lucid...clearly understood even by the most uninformed, the most unenlightened. So what happened to your students on the homework assignment? How could they so badly misconstrue even the most elementary points, how could they miss the author's focus? How could tney fail to warm to the wisdom and worth emanating from every page? How - but more important, why? And so teachers ask what is it that happens to words once they leave the page to enter the mind of the reader, why some ideas are communicated and others misunderstood. What is it, this interplay, that we call comprehension?

We measure reading comprehension most often by multiple choice questions which suggest the aspects of writing that test constructors consider important but do not tell us the aspects of writing that puzzle, intrigue, frustrate and please a reader. We have focused on the product without an understanding of the process. We have defined comprehension within the parameters of responses to objective questions - measuring, perhaps, only a small component of comprehension. Acknowledging our limitations, what then?

PROPOSITIONAL TEXT BASE

Recently, reading professionals have turned to propositional text base analysis procedures developed by Kintsch (Kintsch, 1974, 1975; van Dijk & Kintsch, 1977; and Kintsch & van Dijk, 1978). These procedures provide an objective and replicable system for analyzing discourse and measuring discourse recall. Text is represented as a list of propositions.

In the psychological processing model Kintsch offers a testable model of the comprehension process. The present investigation was designed to test and extend the text base model built from simple narrative discourse by applying it to the analysis of complex expository discourse. Although the present investigation emanated from Kintsch's research, the focus and extent of the study were provided by two additional researchers, Bartlett and Meyer. Bartlett's (1932) research suggested that the debate of the reproductive versus the reconstructive nature of memorial processes could be examined in the context of the recall of discourse. Meyer's studies (Meyer, 1975; Meyer, Freedle, & Walker, 1978) pointed to the possibility that rhetorical predicate structures serve as macrostructures which enhance the recall of discourse.

PURPOSE The purpose of the investigation was to examine the effects of three factors on the comprehension and recall of expository discourse, as measured by a comparison of the recall text base against a standard passage text base. The three factors examined were the order in which a passage is read within a series of passages, the rhetorical predicate structure of the passage, and the topic of the passage. An additional concern in the study involved the qualitative analysis of the recall text base for the presence of argument schema categories, the levels of the propositions in the macrostructure and microstructure of the standard text base, and evidence of reconstructive and reproductive memorial processes.

HYPOTHESES Nine hypotheses were proposed in the study to test the effects of three factors on passage recall in terms of three recall measures. The recall measures under consideration were: propositions explicit in the standard passage text base, propositions implicit (inferences) in the standard passage text base, and errors. An order factor was built into the study as a nuisance variable with the intent of establishing for further research the effect of the order in which a passage is read on the three recall measures. It was hypothesized that the rhetorical predicate structure of a passage, a discourse variable that an author can manipulate, would affect recall. Specifically, it was thought that passages with a more clearly stated relationship between the ideas (a cause-effect relationship and a contrast relationship) would exhibit higher recall of explicit propositions, higher production of implicit propositions, and fewer errors than would the passages lacking a clear statement of the connection between ideas. Finally, because of the equivalence of the passages in terms of a range of variables known to affect recall (length, serial order of ideas, number of propositions, number of different arguments, and schema) it was hypothesized that the topic of the passage would not affect recall on any of the dependent measures.

SELECTION OF SAMPLE All participants in the study were university students enrolled in either a freshman level English composition course or an academic skills development seminar. Subjects were enrolled in a total of six different class sections. All subjects participated on a voluntary basis with no renumeration.

MATERIALS Nine experimental passages, each about 220 words in length, were constructed by the researcher to permit the analysis of predicate structure and passage topic. The three topics of the effectiveness of wage and price controls, the seriousness of the energy crisis, and the use of a surtax to moderate inequities in the tax structure were selected from topics polled by the Gallup Public Opinion Surveys. Each passage contained approximately 105 propositions and 50 different arguments. Passages were constructed to be equivalent in terms of the total number of propositions and different arguments, the serial position of the predicate structures and the statements of the author's position on the topic, the argument schema categories, and the number of propositions and different arguments in the rhetorical predicate structures.

PROCEDURES Each one of the 90 participants in the study read three passages, one for each predicate structure type and topic. After reading a passage one time at a comfortable reading rate, each subject immediately wrote a free recall protocol. Subjects then proceeded to read and write a protocol for the second and finally the third passage in their packet. A total of 270 protocols were collected.

ANALYSIS A recall text base was constructed for each protocol and scored by comparing the propositions in the recall text base with the propositions in the appropriate standard passage text base. Each recall text base was scored for the measures of explicit and implicit propositions and errors.

was analyzed for evidence of argument schema categories in terms of explicit and implicit propositions and for the levels of propositions recalled.

Main Hypotheses Data were analyzed according to the computational procedures specified by Winer (1960) for Plan 11, a 3 x 3 x 3 frational factorial experiment with confounding of the lower and higher order interactions. In order to increase the information available on all interaction effects the investigation included two replications. Once the data for the separate replications had been analyzed, the two replications were combined. A separate univariate analysis was completed for each dependent variable in the separate and in the combined replications. For each hypothesis for which the overall F was found to be significant in the combined replications, Tukey's HSD statistic was calculated.

Argument Schema As the recall text bases were being constructed, the researcher noted that the protocols seemed to follow a similar pattern of organization, reflecting the nature of the argument in the experimental passages. It was decided to add to the study an analysis of a preliminary scope of the argument schema. The recall text bases were analyzed for the presence of macrostructure categories of argument schema explicit and implicit in the standard passage text base. The analysis, being of a preliminary nature, was restricted to one of the two replications. Cochran's Q was

calculated to test for the equivalence of the four argument schema categories across the three passage topics.

Levels Of Propositions

To determine the levels of the propositions recalled, each standard passage text base was graphed. The graph identified the superordinate and subordinate relations between propositions and the argument overlap from proposition to proposition. Based on graphing procedures (Kintsch & van Dijk, 1978) propositions were assigned to levels in the macrostructure and the microstructure of each passage. The percentage of the total number of propositions recalled was computed for the various levels in the macrostructure and the microstructure. For this analysis, passages were grouped by topic. Pearson's r was computed to produce the correlation index for explicit and implicit propositions.

FINDINGS

Order was found to significantly affect the recall of propositions from the standard text base and the addition of implicit propositions to the recall text base. The order effect for explicit propositions was complicated by a significant disordinal interaction of the three factors. It appears that order significantly affected recall in only three of the nine experimental passages but included all three topics. The trend in the recall of both explicit and implicit propositions suggests a practice effect, for subjects produced substantially more propositions of both types for the second passage they read than for the first passage. This

effect leveled off from the second to the third passage, which may have been due to fatigue.

Predicate structure was not found to affect recall. The macrostructure of the experimental passages was provided by the argument schema; predicate structures related ideas at a lower level of the macrostructure, that is they related ideas within one of the four categories of the schema. Further, because the predicates occurred in the middle of the passage, they did not provide a guide for judging the relevance and coherence of all those propositions preceding the occurrence of the predicate structures. Only 3.5% of all the propositions recalled from the standard text base were rhetorical predicate propositions, which suggests that these propositions were not stored or retrieved at the time of recall. The reader, in essence, had to "make sense" of the first half of the passage, because the passage did not contain a guide at the beginning.

Passage topic significantly affected recall, as measured by explicit and implicit propositions. The relative equivalence of the passages in terms of other discourse variables, yet the differential recall of the passage content, suggest that the passage topic, that is, the word concepts themselves, is a discourse variable of importance. It is, understandably, one factor that researchers have tended to ignore, for the author cannot improve comprehension by manipulating the topic: it is what it is.

When analyzed by level in the passage structure, the percentages of the explicit propositions recalled suggest superior

recall for macrolevel propositions, as has been reported in earlier research (Kintsch, 1974, Kintsch et al, 1975, Kintsch & van Dijk, 1978; Meyer, 1975). It should be noted, however, that macrolevel recall did not account for approximately 40% of the propositions recalled. The subjects, operating in an academic setting, may have been influenced by a general "school schema," (i.e., when in school memorize "facts") which would emphasize microlevel information.

The mean recall per subject over three passages was 22 propositions or 7% of the standard passage text base. Implicit propositions were added to the text base at three times the rate of recall of explicit propositions, with a mean of 64 implicit propositions per subject. Thus 21% of the accurately produced propositions involved the processing of information implicit in the standard text base. Subjects produced a mean of 9 errors, for a 3% error rate.

If one combines the two measures for the accurate reconstruction of text, the explicit and implicit propositions, it is evident that only 28% of the standard text base was recalled. Three percent of the text base was recalled inaccurately, while a full 69% of the propositions were not produced at the time of recall. It is not known whether this almost 70% of the propositions were not placed in storage at the time of processing or were merely not retrieved. The low positive correlation (.24) found to exist between the two accurate recall measures suggests that only 6% of the variation of propositions added to the text base could be accounted for by the relationship with the explicit

propositions recalled. Subjects who recalled many explicit propositions were not the same subjects who added accurately inferred ideas to the text base.

DISCUSSION Bartlett's seminal work Remembering (1932) challenged the widely held view of memory as a process based on the reproduction of trace elements. Bartlett proposed instead the theory of memory as a reconstructive process, with the recall of information being guided by cognitive structures known as schemata. Bartlett's view finds support in the analysis of the argument schema and implicit propositions. The recall text base for two of the three experimental passage topics reflected the presence of macrolevel propositions which conformed to the four categories of the argument schema. Protocols tended to begin with a general statement of the issue, to restrict that issue, to state a position on the issue, and to support the position. It is possible that the argument schema was turned back on itself, guiding the reconstruction of the discourse. For the topic with the lowest production of implicit propositions and the highest number of errors, only three of the four schema categories were present in the recall protocols. It is possible that the incomplete schema negatively affected recall.

Meyer's findings were not substantiated. Given the nature of the experimental passages, this is understandable. Predicate structures are not, in and of themselves, macrostructures. In Meyer et al, the predicate structures were the highest level of macrostructure. Such was not the case in the present investigation. Further, the manipulation of predicate structure to

facilitate recall is suspect, for such manipulation may distort the relationship that exists among and between ideas. Although the predicate structure may be altered by an author or examined by a researcher, there may be little pragmatic value in doing so, unless we are trying to learn the relative difficulty of processing various structures so that we might construct equivalent test passages.

Kintsch's psychological processing model suggests the manner in which incoming information is acted upon during the comprehension process. Propositions provide the input of the model. As an individual reads a passage of discourse, he processes the discourse, in chunks, as a list of propositions. The reader checks for referential coherence which is provided by the repetition of arguments in the proposition list. If coherence is not found, processing ceases and the reader must make inferences in order to comprehend. Having to make inferences, that is, to add propositions to the standard text base, renders the comprehension task more time consuming and difficult, for the reader must search in long term memory for information that would lend coherence to the incoming proposition list. Kintsch's model suggests that recall for passages with little referential coherence would 1) reflect the need to make inferences and 2) reveal the difficulty of the comprehension task. Both implications of the model were supported in the present investigation. Each passage contained an average of 105 propositions and 50 different arguments, with minimal repetition of the arguments. As revealed by the 7% recall of explicit propositions, the

subjects appeared to find the passages difficult to process and remember. As evidence of the implication that readers would have to add to the text base in order to comprehend, the recall text bases contained three times as many implicit as explicit propositions. Thus what Kintsch has reported with passages of narrative discourse and with more referentially coherent passages was substantiated in an investigation which required the subjects to read a series of complex expository discourse passages.

CONCLUSIONS AND IMPLICATIONS

The present investigation found no replacement for the multiple choice method of assessing reading comprehension. Nor did the study indicate a simple means, via the alteration of predicate structure, of facilitating comprehension of text. The findings did not even permit the researcher the luxury of dismissing the influence of order (as apparent from the practice and fatigue effects) in future repeated measures designs. What the investigation has done, however, is demonstrate the applicability of Kintsch's text base analysis procedures to the measurement of comprehension of complex text, substantiate the implications of Kintsch's psychological processing model with subjects and materials heretofore unmeasured, and identify factors affecting comprehension needing further study.

If we are to identify some of the elements of text that facilitate comprehension and those that make it more difficult, we need a tool which will enable us to see what a particular

reader or types of readers comprehend of a passage. Further, we need a tool that will allow us to identify in more than an impressionistic fashion the relative importance of the word concepts of a text. Kintsch provides us with at least one tool for these purposes. Should the procedures followed in this study be applied by classroom teachers and authors of texts and/or tests, these individuals would know that passages such as those used in the investigation would be difficult, perhaps unnecessarily so, even for relatively sophisticated college readers. If promoting comprehension were the goal, the passages could then be revised to exhibit referential coherence, or students could be given a short processing guide prior to reading.

Reading professionals have long accepted the importance of prior knowledge in comprehension. We have shyed away from the investigation of this phenomenon because we have believed it is not something we can teach our students with the ease that we teach them the rules of syllabification, and it is not a discourse variable that a writer can alter for the purpose of promoting comprehension. We may now have to accept that the general knowledge a reader brings to the reading task is of increasing importance as the difficulty (in terms of referential coherence) of the reading material increases. We will not succeed in rewriting the world. Comprehension will not occur for the reader who is unable to make sense of text by adding to the text from his general knowledge. We who work with even adult readers are in this sense not teachers of reading, but teachers of a wealth of knowledge. Prereading activities appear no less

valid for the adult reader than for the beginning reader, for the texts which many adults read require that they have at their disposal the knowledge (stored as propositions) needed to make the texts coherent and therefore understandable. To teachers who have fought their way through Ulysses, Portrait of An Artist is lucid. To students who have read little, even the easiest of Joyce would be obscure.

Reference List

Bartlett, F.C. Remembering. Cambridge, England: Cambridge University Press, 1932.

Gallup, E.J. (Ed.). The gallup poll: pulic opinion 1972-1977 (vol. 1). Wilmington, Del.: Scholarly Resources Inc., 1975.

Grimes, J.E. The thread of discourse. The Hague, Holland: Mouton, 1975.

Kintsch, W. The representation of meaning in memory. Hillsdale, N.J.: Erlbaum, 1974.

Kintsch, W. Memory for prose. In C.N. Cofer (Ed.), The structure of human memory. San Francisco: W.H. Freeman, 1975.

Kintsch, W., Kozminsky, E., Streby, W.J., McKoon, G., & Keenan, J.M. Comprehension and recall of text as a function of content variables. Journal of Verbal Learning and Verbal Behavior, 1975, 14, 196-214.

Kintsch, W., & van Dijk, T.A. Toward a model of text comprehension and production. Psychological Review, 1978, 85, 363-394.

Meyer, B.J. The organization of prose and its effects on memory. North-Holland Publishing Company, 1975.

Meyer, B.J., Freedle, R.O., & Walker, C.H. The effects of different discourse types on the recall of young and old adults. Unpublished manuscript, Educational Testing Service, 1978.

Winer, B.J. Statistical principles in experimental design. New York: McGraw Hill, 1960.

Van Dijk, T.A. Discourse meaning and memory. Journal of Reading Behavior, 1976, 8, 89-110.

Van Dijk, T.A., & Kintsch, W. Cognitive psychology and discourse: recalling and summarizing stories. In W. Dressler (Ed.), Current trends in textlinguistics. Berlin: de Gruyter, 1977.